

Generative Art



Exploring how this process simulates nature, and if the method is essential to the meaning of the artist's work? Looking at works through Philip Galanter, Joseph Nechvatal, and Shardcore.

Abstract

Generative art is not an art movement or ideology, it is mainly known or thought of as a process, yet artists utilize this method for a number of different reasons. This paper will attempt to question and explore generative art by looking at some of the motives behind this practice. Beginning by giving a brief exploration of generative art, before looking at how this method may simulate nature by discussing chaos theory and its relationship to specific styles using this method. Subsequently discovering if using a generative process has been essential to the meaning within the artist's work, by looking at works through the featured artists via interviews collected predominantly for this paper; in conjunction with exploring leading writers in this field.

Although generative art can be utilized as a process or tool. I hope this paper will express how it can also be a fundamental element that artist's employ, thus expressing how generative methods can hold the essence and meaning within the artwork.

Keywords

Generative Art, Essence, Simulation, Nature, Process, Chaos Theory.

Contents

Pg 1.....	Abstract
Pg 2.....	Contents
Pg 3.....	List of illustrations
Pg 4.....	Introduction
Pg 5.....	Exploring Generative Art
Pg 7.....	Chaotic Systems
Pg 9.....	Process or Concept?
Pg 14.....	Conclusion
Pg 15.....	Appendix 1
Pg 19.....	Appendix 2
Pg 24.....	Appendix 3
Pg 27.....	Bibliography

List of illustrations

Front Cover: *Generated Toy of Kay*, Kay Johns, 2010, Video, Video Extract (approx 1:54 / 4:21 mins) <http://kayjohns.blogspot.com/2010/11/critique-1.html> November 2010.

Fig 1: *Computer Virus 2.0*, Joseph Nechvatal, 2002, Video, Video Extract (approx 00:04 / 6:28 mins) <http://www.nechvatal.net/> November 2011.

Fig 2: *Computer Virus 2.0*, Joseph Nechvatal, 2002, Video, Video Extract (approx 00:15 / 6:28 mins) <http://www.nechvatal.net/> November 2011.

Fig 3: *Computer Virus 2.0*, Joseph Nechvatal, 2002, Video, Video Extract (approx 05:24 / 6: 28 mins) <http://www.nechvatal.net/> November 2011.

Introduction

This paper will attempt to question and explore generative art by looking at some of the motives behind this practice. Looking at works through three artist's Philip Galanter, Joseph Nechvatal, and Shardcore, along with exploring leading writers in this field.

Formed of three main chapter areas. Beginning by giving a brief exploration of generative art in chapter one. While chapter two will focus on how Generative Art can simulate nature by discussing chaos theory and its relationship to specific styles using this approach. The topic for the third chapter will be discovering if using a generative process has been essential to the meaning within the artists work, by looking at works through all the featured artist's.

This area of study was chosen in conjunction with the creative processes of my own studio practise, to conceptualize and explore the natural world, whilst questioning the existence of individuality within a system.

Exploring Generative Art

Generative art refers to any art practice where the artist uses a system, such as a set of natural language rules, a computer program, a machine, or other procedural invention, which is set into motion with some degree of autonomy contributing to or resulting in a completed work of art. (Galanter, 2003: p.4)

In recent years the above text has become one of the foremost definitions of generative art. It is by Philip Galanter artist and professor at Texas A&M University. (Pearson, 2010). The text is from his paper titled: *What is Generative Art*. (Galanter, 2003). While I have read other papers and definitions on the subject. I can see why Philip Galanter's definition has become very popular as it manages to capture the basics of generative art in just a few lines. It is clear, concise and personally I think leaves the reader wanting to find out more about the subject. The opening line begins by saying that generative art refers to any art practice, which I think is something that is often overlooked. I have noticed a tendency for people to talk about generative art only in terms of using generative software, whereas generative art can include a variety of other mediums, to name just a few, kinetic/ sound sculpture, performance art.

One of the earliest recorded examples of a generative artistic system is from the 18th Century titled *Musikalisches Würfelspiel* (musical dice game) by Wolfgang Amadeus Mozart. Mozart explored a random process to create a Minuet by piecing together a mixture of pre-written pieces which were decided by a dice roll. (Pearson, 2010).

The concept of Generative art has been around for a while, but it hasn't been until the 1960's that the term has been in broader use. (Pearson, 2010) Over the years generative art has since been explored in a wide range of various mediums within the artistic community.

In 1998 a series of conferences started in Milan which helped promote generative art. The website for this is known as generativeart.com which Brian Eno has been involved with, and has helped with the development of conferences and exhibitions. (Eno, 1996) (Boden & Edmonds 2009). This site also has research papers by people from all over the world listing back from 1998 up to the present. There are also

streaming movies to watch. These are all free to download and you can give a donation if you choose.

In 2005 Marius Watz founded a website called Generator.x which was established to create a conference and touring exhibition, mainly focusing on artists who employ code for artist expression. (Watz, 2005).

Since the arrival of the internet Generative art has since become considerably more popularised through the promotion of artworks. Even in popular culture films, such as *Tron Legacy* where the isomorphs existence, that were created out of the digital world of Flynn's creation (Kosinski, 2010) could have also be seen to promote generative art. Though perhaps the isomorphs are more related to chaos theory.

The next chapter will take a look at how generative art can simulate nature by discussing chaos theory and its relationship to specific styles using this approach.

Chaotic Systems

Going back in the past to just before the middle of the Twentieth Century Alan Turing, famous British code-breaker, mathematician/computer scientist, used mathematical equations to explore the emergence of life-like organisation of chemicals. Around the same time the work of a Russian Chemist called Boris Belousov initiated the field of modern nonlinear chemical dynamics. These men never met, yet the mathematics of Alan Turing's equations explained how the experiments of Boris Belousov's nonlinear chemical experiments behaved! At the time, these innovative ideas of both Turing and Belousov were not accepted by the scientific community. It was not until the 1960's when an American meteorologist, called Edward Lorenz was working on a problem of weather prediction, that he realised that the weather was impossible to accurately predict! In turn this finally led scientist's to take both Turing and Belousov's work seriously. (Stacey, 2010).

In the book *The Essence of Chaos*, Edward Lorenz elucidates:

While conducting an extensive experiment in the theory of weather forecasting, I had come across a phenomenon that later came to be called "chaos", seemingly random and unpredictable behaviour that nevertheless proceeds according to precise and often easily expressed rules. (Lorenz, 2005: p.vii)

Edward Lorenz established that a basic model of heat convection possesses inherent unpredictability, a state or condition that he called the *butterfly effect*, where the slight flapping of a butterfly's wing can change the weather (Encyclopaedia Britannica, 2011).

Analog video feedback loops can be used to simulate an example of the *butterfly effect* by creating a video signal loop where the video camera is facing directly at its own display, to create multiple images. Then by zooming the camera into the display, this will transform the image further, with unpredictable results occurring. (Stacey, 2010).

Artist's that have explored feedback systems in their work include early video artist's Steina and Woody Vasulkas. Steina Vasulksa first began designing feedback

devices around the middle of the 1970's. The feedback devices reverberated sound waves off video signals and vice versa. (Langlois, 2010).

In an interview with Philip Galanter, he mentioned that he first began experimenting with analog video feedback around 1990, due his musical development to create live music as a solo performer. However he was worried that a live solo musical performance may be incredibly boring to watch, as he would basically be moving dials and clicking switches. So he began experimenting with analog video feedback initially to quickly create lots of visuals to project. Philip wasn't aware at first that a video feedback is a chaotic system. (Galanter to Johns, 2011, Appendix 1).

Philip explains:

It was only later that I realized that video feedback is a chaotic system and a legitimate intention could be the exploration and presentation of chaos theory.

I came to realize that generative art is all about using systems, and complexity science is all about understanding systems.

(Galanter to Johns, 2011, Appendix 1).

Through employing a video feedback loop, (chaotic system) within the realms of generative art which was used simply as a tool, to create lots of quick visuals.

Philip's work has since transmogrified giving a meaning to this process.

So by knowing that a video feedback loop is a chaotic system, this work could be thought to explore a concept within a chaotic system, whereby using a specific process becomes part of the hypothesis of the work. This work could then be seen as a simulation to depict order and chaos within the natural world.

Following this trail of thought, knowing there can be meanings within certain generative processes. The next chapter will discover if using a generative process has been essential to the meaning within the featured artists work.

Process or Concept?

While generative artist's will have many different reasons for employing generative systems, this section will attempt to explore some of the motives by exploring interviews with the featured artist's Philip Galanter, Joseph Nechvatal and Shardcore.

Continuing on from the interview in the previous chapter, Philip Galanter explains further about his work today:

Over the years my work has increasingly become a sort of meditation on complex systems, and so the pieces are about the very generative systems they contain. The art is the system and the system is the art.

If you want to create art using complexity and generative systems why not study under the master? That would be nature. In my work I'm not seeking to simulate nature so much as to learn from it. (Galanter to Johns, 2011, Appendix 1).

Philip's work has certainly transformed over the years, from music to generative visuals, to the study of complex systems, to becoming a leading artist/theorist in the field of generative art and complexity science. I find it fascinating that while he originally employed video feedback visuals simply to entertain people and stop them from being bored, this then led to so much more. In Philip's work he mentioned that he is mainly looking to learn from nature rather than to simulate it. (Galanter to Johns, 2011) While the following Artist Joseph Nechvatal chooses to directly simulate nature through his artwork. (Nechvatal to Johns, 2011, Appendix 2).

In an interview with Artist Joseph Nechvatal, (Ph.D. in the philosophy of art and new technology from Roy Ascott's Centre for Advanced Inquiry in the Interactive Arts (CAiiA) at The University of Wales College) he talks about why he wanted to simulate nature in his work. It began in the 1970's while undertaking a degree in Sociology, when upon seeing a large illuminated stain-glass window in a cathedral. (Nechvatal to Johns, 2011, Appendix 2).

Joseph elucidates:

It was an intense moment of color in a black night. Something told me then and there that the way to social change was the way of nature in art - in that art addresses the natural inner unique individual rather than the group, the

sociological statistical. In that sense I saw art as a means to foster social change from nature - bottom-up, rather than top down, if you will. (Nechvatal to Johns, 2011, Appendix 2).

Joseph has since created many generative art works. In *Computer Virus Project 2.0*, Joseph and Stephane Sikora (programmer/collaborator) uses C++ framework to create this artwork, which has subsequently preceded from previous viral works. (Nechvatal, 2002). The image below (fig 1) is an extract from the very



Fig 1: Joseph Nechvatal, *Computer Virus 2.0*, video extract (approx 00:04 / 6:28 mins) from www.nechvatal.net

beginning of the video of *Computer Virus 2.0*. In fig 2, the virus attack can be seen starting to slowly degrade the image.

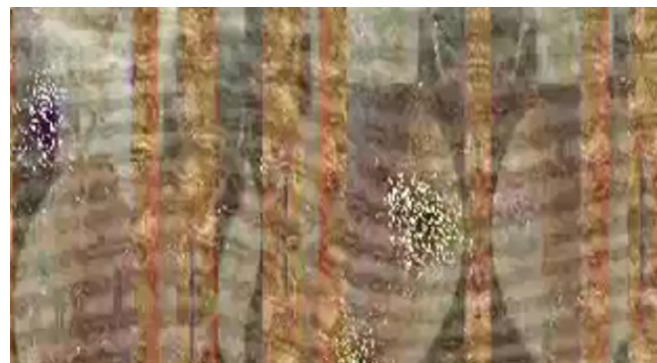


Fig 2: Joseph Nechvatal, *Computer Virus 2.0*, video extract (approx 00:15 / 6:28 mins) from www.nechvatal.net

The final image (see fig 3) is an extract taken near to the end of the video. The virus has spread to a point where there is hardly anything left of the original image.



Computer Virus 2.0 Project, (which can be viewed from Joseph Nechvatal's website: www.nechvatal.net) the video/audio explains:

With Computer Virus Project 2.0, elements of artificial life have been introduced in that viruses are modelled to be autonomous agents living in/off the image. The project simulates a population of active viruses functioning as an analogy of a viral biological system. (Nechvatal, 2002)

Since this artwork was clearly about a virus attack, and the generative process obviously appeared essential to the concept of the work. I asked Joseph if there had ever been a time when he employed generative art as just a process? He replied: 'Never.' (Nechvatal to Johns, 2011, Appendix 2).

Joseph explains:

I did not come to using generative software for its own sake or from an interest in the formal properties of generative software. After my first paintings were created using robot-assisted means in 1986, I sought to create paintings around the computer-assisted concept of the virus. So I developed this idea by considering an image as a host. (Nechvatal to Johns, 2011, Appendix 2).

While I assumed a generative process must be essential to the meaning within *Computer Virus Project 2.0*, it was interesting to find out that Joseph Nechvatal has never used generative software for its own sake in any of his other work either.

The final artist's work that I will be exploring in this chapter will be an exhibition that I stumbled across, called *The Consciousness Engine* by artist's Shardcore and Sam Hewitt. *The Consciousness Engine* exhibition took part in this year's 2011 Brighton Festival in the UK. I have not mentioned Sam Hewitt previously because I only interviewed Shardcore and Sam's views may be slightly different.

The consciousness Engine consisted of a series of rooms filled with a combination of digital, and sculptural artworks, using both video and audio to elucidate an entity, a consciousness, contemplating its life by self identification. (Shardcore, 2011).

My favourite part of this exhibition was a generative video installation in the basement of the building, known as *The Core of The Engine*. The walls were covered in ceramic white tiles that the video was projected onto, which gave a geometric graph like effect. This felt quite apt upon discovering it was the voice of a computer speaking in the video. The computer made random sometimes contradictory statements, along with showing random scenes of places around Brighton.

In an interview with Shardcore he mentioned how a generative system was vital to the piece which worked on two levels. While initially it represents a facet of consciousness, which would need a lot of work to express without using a generative system. It also sets a precedent for uniqueness to materialize. (Shardcore to Johns, 2011, Appendix 3).

Shardcore explains:

Just as in the conscious mind, no two moments are the same - we wanted to create a machine that, while bounded to the limits of the source content, could still produce new juxtapositions that we were unable to predict. (Shardcore to Johns, 2011, Appendix 3).

When planning *The Consciousness Engine* they never intended to create a naturalist environment. The generative aspect was creating an experience of a conscious mind continuously in flux. (Shardcore to Johns, 2011, Appendix 3).

Shardcore clarifies:

I wanted the viewer to be an involved observer of a simulated mind, and for that, it was essential that it was constantly changing. If we had used a pre-composed, pre-recorded film, it would have been a different piece entirely. (Shardcore to Johns, 2011, Appendix 3).

I found that the Core of the Engine (computer) related more to my subconscious mind. It felt like I was experiencing a dream filled full of random questions and different locations around Brighton, which were reminiscent to some of my own thoughts and memories (since I live in Brighton). While simultaneously thinking about the nature of consciousness in the realms of a computer entity.

Even though using a generative system was a great way to initially save time and put together a lot of work. Generative software was also essential to the concept of the piece to express a consciousness in a state of flux.

Conclusion

While the term Generative art is mainly known or thought of as a process. It is not an art movement or ideology, yet it does appear to be a fundamental element of which the artist's featured in this paper have used as a form of enquiry for exploration in their work. Whether this be through observing and learning from nature by creating aesthetic patterns by exploring chaotic systems or to use directly as a concept to simulate aspects of nature, or for metaphysical/ontological inquiry. While these are just a few examples from the interviews explored from the featured artists in this paper, their motives for using generative systems are all quite different. Although generative art can be utilized as a process or tool the underlying elements from these interviews are that the generative systems employed, have been considered a vital component within the artwork, which has not been used simply as a process or tool.

Appendix 1

An Interview via email with Philip Galanter, by Kay Johns

Monday 21st September 2011.

Kay Johns: Could you describe a little about your background and how you became interested in generative art?

Philip Galanter: *The first arts activity that I participated in in a serious way was electronic music. This was back in the 1970's using analog synthesizers. The part I found most fascinating, along with the notions of timbral composition, was that the synthesizer could play itself. By using a sample and hold unit, for example, one could create random voltages or cascading stair-step voltages that would in turn determine pitch, loudness, stereo placement, and so on. So I would create these systems by patching together various modules and then sit back and listen. The term "generative art" wasn't used then, but that's what it was.*

I went through a long period of pursuing various musical interests including punk, industrial, and various experimental and performance art forms. Little of that was generative. It was the more typical group collaboration style of manual music production.

Around 1990 I tired of collaboration and was trying to figure out a way I could affordably create live electronic music as a solo performer. One concern I had was that it would be terribly boring to watch; just a guy pushing buttons and tweaking knobs. So I began experimenting with analog video feedback as a fast way to create lots of visuals that I could project. That led me to the edge, and I fell over and became more focused on visual art. And with video feedback I was once again back in the generative realm.

Because for years my day job had been scientific programming, and even included non-artistic graphics, it was only natural that I would soon turn to digital tools for generative visual art.

Kay Johns: Is there a reason that you use generative software as part of the piece as a message within your own art work, or do you just use generative software as a process for making the work and it has no relevance to the actual art work? I was particularly thinking of some of your generative animations: worms, blobs, and light box drawing as I would imagine using generative software played an important aspect within the meaning of this work, but I'm also curious about your other generative artworks too.

Philip Galanter: *The question as to whether the generative approach is merely pragmatic or whether it is embedded in the work as content is a very interesting one. Initially my interest was purely pragmatic. In support of live performance I needed more visual material than I could practically create by hand, and so using generative systems was really the only way I could go. At the time my goal was to use analog video feedback in such a way that it didn't look like all the other video feedback that had been created by then. I didn't want it to be about the way it was made. It was only later that I realized that video feedback is a chaotic system and a legitimate intention could be the exploration and presentation of chaos theory.*

As my interest in generative systems grew I became aware of complexity science. It's essentially an attempt to theorize across a diversity of domains and produce models and abstractions that can apply to what previously seemed to be unrelated systems. For example, is there something we can say about ant hills, the human brain, and weather systems that helps us understand all three? At the time this was pretty exotic stuff, but now to some extent it's become absorbed into the popular culture. Unfortunately the science of complexity is more subtle and complicated than the popular interpretation and folks tend to underestimate the depth of the complexity waters.

Anyway I came to realize that generative art is all about using systems, and complexity science is all about understanding systems. I came up with a generative art theory using complexity theory as a context for considering systems. This led to a paper "What is Generative Art" that contains the most widely cited definition of generative art.

Over the years my work has increasingly become a sort of meditation on complex systems, and so the pieces are about the very generative systems they contain. The art is the system and the system is the art. I refer to this as "truth to process" in some recent writing.

Kay Johns: Are there any art movements that have influenced your work?

Philip Galanter: *I believe that art proceeds by accretion. Art movements are never lost or reversed, rather each new art movement layers itself over the last. So in a way every art movement is still present and influential.*

But we all have our favorites. Very little art before the 20th century excites me. For me Mondrian and Pollock are huge influences, with Mondrian contributing the Apollonian principle in art and Pollock the Dionysian. But really the entire pantheon of abstract expressionists is huge for me. Minimal and conceptual art is, not surprisingly, a big influence on me. I understand and enjoy pop art although it's hard to see in my work. Maybe it's visible in my use of unsubtle fully saturated color. Warhol appeals to me both as a visual artist, but also in terms of his contributions to film and music. Without Andy there would have been no Velvet Underground, and they influenced so many others it's hard to imagine what rock music would have been like without them. Music has probably influenced me more than other visual artists, although it's hard to pinpoint exactly how that comes out.

Back when I did purely music my approach was much more Dionysian. My visual art has been mostly Apollonian. It may be time for the pendulum to swing again.

Kay Johns: Are there any reasons why you choose to simulate nature?

Philip Galanter: *Artists have always learned from nature. Of course in the postmodern era saying such a thing is viewed as being, at best, quaint. But increasingly folks have tired of postmodernism. There is now a whole generation of young artists embracing science and technology as not only a useful source of tools,*

but as a cool and creative subculture. So you have the arduino and Maker Faire and folks wiring up kinects to sound chips and so on. There's even this notion of art-science as a hybrid discipline with a claim to its own identity. So artists have always learned from nature and so have scientists.

If you want to create art using complexity and generative systems why not study under the master? That would be nature. In my work I'm not seeking to simulate nature so much as to learn from it. Some of my work has biomorphic form in it, but I don't view that as being essential to the work. Two recent pieces, RGBCA 1 and RGBCA 2, are much more minimal in style; cubes, hemispheres, lines. But they are still generative, they are still systems, and they are about the systems they are.

Philip Galanter
Assistant Professor
Department of Visualization
Texas A&M University
C108 Langford Center
3137 TAMU
College Station, TX 77843-3137

Office - C306
Phone - 979.845.4710
<http://philipgalanter.com>

Appendix 2

An Interview via email with Joseph Nechvatal, by Kay Johns

Friday 22nd July 2011.

Kay Johns: Could you describe a little about your background and how you became interested in generative art?

Joseph Nechvatal: *Sure. I took a BFA at Southern Illinois University in Carbondale first, making art in a permissive post-minimalist environment. I then went to Cornell University with the idea of getting an MFA, but found the art department there years behind Southern Illinois University, so I left and went to New York and Columbia University where I worked towards an MPhil, studying with Arthur Danto, most notably. In the late 90s I earned a Ph.D. in the philosophy of art and new technology at Roy Ascott's Centre for Advanced Inquiry in the Interactive Arts (CAiiA) at The University of Wales College. That was a fantastic intellectual experience. My research was focused on the immersive ideals behind virtual reality. You can examine the introduction and download the full thesis as a pdf file if you wish.*

My involvement with Alife comes out of my artistic post-conceptual background. From 1991-1993 I worked as artist-in-resident at the Louis Pasteur Atelier and the Saline Royale / Ledoux Foundation's computer lab in Arbois, France on what I came to call The Computer Virus Project. This was my first experiment with computer viruses as a creative ploy. I created a series of digital paintings and a computer animation from this process. I worked there with Jean-Philippe Massonnie at the Laboratoire MIS at the Université de Franche-Comté on the initial software - which was written in Basic. At the time I would launch a viral attack into the host image - which was my body of visual work accomplished up to that time. However there was nothing to see as the computer virus went through its procedures until I would check to see what had happened overnight.

The AIDS virus was impacting on me emotionally at the time, so it made sense to move in that direction. I wanted to overcome the fear I was feeling - and it expressed my attraction towards things beauté tragique. I think that the life/non-life idea

*inherent in the viral situation is fascinating. The text *The Electronic Revolution* by William S. Burroughs from 1970 was also key to the idea. In it he theorizes that the written word was literally a virus that made spoken word possible.*

*Then in 2002 I extended that artistic exploration into the field of viral artificial life through my collaboration with the programmer Stéphane Sikora. I met Stéphane at a conference organized by Prof. Jean-Claude Heudin called *Virtual Worlds 2000*, which was held at Pôle Universitaire Léonard de Vinci in Paris. The conference's goals, which, like the first *Virtual Worlds* conference in 1998, were to develop a discourse around the merging of *Virtual Reality (VR)* and *Artificial Life (ALife)* (what one might call *VRALife*). This involved the study of synthetic systems that exhibit behaviors characteristic of natural living systems inside virtual reality worlds.*

I fell into conversation with Stéphane and from that we launched into a collaboration intended on extending my previous exploration with computer software modeled on the viral.

Kay Johns: Is there a reason that you use generative software as part of the piece as a message within your art work, or do you just use generative software as a process for making the work and it has no relevance to the actual art work? I was particularly thinking of your *Computer Virus 2.0*, as I would imagine using generative software played an important aspect within the meaning of this work, but I'm also curious about your other generative artworks too.

Joseph Nechvatal: *Indeed I did not come to using generative software for its own sake or from an interest in the formal properties of generative software. After my first paintings were created using robot-assisted means in 1986, I sought to create paintings around the computer-assisted concept of the virus. So I developed this idea by considering an image as a host - used to host viruses: active agents whose role it is to manipulate and degrade the information contained in the image. The negative connotations of the HIV virus as a vector of disease is reflected in the principle of degradation of the image. But here, the virus is also the basis of a creative process, producing newness in reference to vector genetic information in biological systems.*

Kay Johns: I assumed this was the case with your Computer Virus 2.0 project. Has there ever been a time when you employed generative art as a just a process?

Joseph Nechvatal: *No never.*

Kay Johns: I have read that you were inspired by A-life work of John Conway. Is there anyone else's work that has particularly inspired you too?

Joseph Nechvatal: By the general cellular automata work of John von Neumann, by the genetic programming algorithms of John Koza and the auto-destructive art of Gustav Metzger.

Kay Johns: Are there any art movements that have influenced your work?

Joseph Nechvatal: *Dada, for sure. Also Conceptual Art.*

Kay Johns: Are there any reasons why you choose to simulate nature?

Joseph Nechvatal: *It started when I was a sophomore at University, pursuing a degree in Sociology. I was deeply involved in the political/social issues of the early 1970s; i.e. the anti-war, woman's liberation and equal rights movements. I was home in Chicago for the summer, working at some shit job to pay for my University expenses. Art had been a hobby-interest with me up to that point. Anyway, I was riding around downtown Chicago on a motorcycle, somewhat in a psychic funk. As I zoomed pass some cathedral, a large illuminated stain-glass window caught my eye. It was an intense moment of color in a black night. Something told me then and there that the way to social change was the way of nature in art - in that art addresses the natural inner unique individual rather than the group, the sociological statistical. In that sense I saw art as a means to foster social change from nature - bottom-up, rather than top down, if you will.*

Kay Johns: In an interview with Tom Barbalet for Biota.org you mentioned:

The Alife approach is only a painting tool or utilitarian expression in its manifestation. For me, my work with Alife is an abstract way of doing philosophically based art. Cyborg imagery in pop culture, I suppose, fruitfully fertilized this aesthetic effort by imaginatively inviting me to experience my ontology through losing track of my body and becoming what seems to be pure viral consciousness.

Do you mean a consciousness that exists without a body, a consciousness that has been invaded by another, or did you have some other meaning in mind? Could you explain what you mean by 'pure viral consciousness'?

Joseph Nechvatal: *The history of art and the history of technology are often marked by ruptures. Most histories, overlook moments where deep fusion occurs, as I see happening now with viractuality. Perhaps, another temporal model for cultural consciousness is needed. Something other than the, majestic forward and upward thrusting model of evolution. Something more humbly folded in, on itself (as Deleuze suggests). Or perhaps something even more insinuatingly penetrating – as, in a viral-host model. I have chosen the viral model – so let us now consider the activities of the, viractual as a surge of emergent and embedded critical consciousness that offers us a formal, clarity true to our age.*

After a long period of temporal disjunctions following the demise of the modernist project and, the excessive abuses of the post-modernist non-project; I wish to now suggest that a new, clarifying paradigm has emerged based not, however, on the ideals of the raw, the pure or the, reduced - but rather on the internal tic-tic-tic bomb time of the embedded and patient viral, attack. So I am suggesting here a seething project of critique within critique that re-energizes, the broken gaps of temporal displacement that followed the demise of modernism and the, appearance of now listless – super fragmented – irresponsible – glut of post-modern deconstruction.

When looking at cultural production through the paradigm of the viral viractual, many former, binary oppositions fail to function in a stable way - and start to pulse – transfusing, consciousness. Most basically, even the definitions of life and death are destroyed by this model;, as a biological virus is precisely neither alive nor not-alive

– as it depends for its existence totally, on it's host's viability. The seeing-power of the host/parasite model alone must not escape us. A, virus cannot – and does not – exist alone. It exists solely by entering in and coupling. So when, we add the once binary definitions of virtual and actual into the voluptuous viral model of, existence - and observe how they interact - a form of both/and fusion difference appears, dominant within the scope of the viractual lens.

Kay Johns: I have read about the concept of viractual, which strives to create an interface between the biological and the virtual. I think most people would think of a keyboard or mouse as an interface, but would you also consider a program to be viractual?

Joseph Nechvatal: *I think programing that leans towards the genetic programming can be. As you may know, genetic programming is a technique for writing code in a computer program based on artificial intelligence that uses an algorithm-based method that takes its programming cues from biology. In my case from the biology of the virus. Indeed, for me, bio-tech genetic programming as applied to the traditions of painting and art music is so important to the ideas of viral viractuality that it may be said to be emblematic of it. This because it represents the seminal function of viractuality: that activity that occurs between the wild realtime and the captured archived.*

For more information on Joseph

Nechvatal: <http://www.nechvatal.net> blog: <http://post.thing.net/blog/244> - new book :: Immersion Into Noise <http://www.openhumanitiespress.org/immersion-into-noise.html>

Appendix 3

An Interview via email with Shardcore, by Kay Johns

Tuesday 13th September 2011.

Kay Johns: Your video in the basement of the market place was made using generative software. Was there a reason to use generative software as part of the piece as a message within your work, or did you just use generative software as a process for making the work and it had no relevance to the actual work?

Shardcore: *The use of a generative system was integral to the piece. It operates on two levels, firstly as representing one facet of conscious experience - that it is continuous, mutable experience (a feat which would either require a huge amount of scripting/editing without a generative system). Secondly, it allows for the content to appear as truly novel, just as in the conscious mind, no two moments are the same - we wanted to create a machine that, while bounded to the limits of the source content, could still produce new juxtapositions that we were unable to predict.*

Looking more broadly, generative systems allow the artist to step away from the explicit form of the work, and into the realm of meta-creation - making the rules that govern the creative process, rather than explicitly creating the end piece itself. By loosening the grip on the end product, the artist is able to use the outcomes of a generative system to inform the manipulation of that system; the artist becomes a benevolent curator of the work, rather than the direct creator of the end product.

Kay Johns: Would you say that as the artist you wanted to explore consciousness via an artificial source (the computer, core of the engine) using the process known as generative art to express and simulate existence of the natural world?

Shardcore: *We wanted to explore consciousness, and that exists in a place beyond what is generally considered 'the natural world'. So, in that sense, we were never aiming to create a naturalistic environment.*

The generative nature of the system, for me, was far more about creating an experience in flux, just as the conscious mind is constantly in flux - it makes no sense to take a snapshot of a mind, it's very nature is one of change - and that's why it had to be a generative machine. I wanted the viewer to be an involved observer of a simulated mind, and for that, it was essential that it was constantly changing. If we had used a pre-composed, pre-recorded film, it would have been a different piece entirely.

In building the piece, I wanted to avoid existing AI paradigms and produce a purposefully (semi-controlled) chaotic system. AI generally concerns itself with simulation of specific parts of the human mind to appear 'intelligent' in a rather narrowly defined sense.

The Consciousness Engine exists not as an end-point, but as a symbiotic process between the machine and the viewer. The viewer needs to engage their conscious mind directly with the machine for the work to exist. When no one is observing it, it's just a machine talking to itself in an empty room.

Conscious experience is primarily a constructive process - what you 'experience' of the world is mainly a projection of psychological expectations. With this piece I wanted to draw out the mind behind the expectations, the machine provided a method for doing this.

My hope was that the piece, along with the journey of installations before reaching the machine, would guide the viewer into a place where they were provoked to consider the nature of their own consciousness, and not simply assume the role of passive observer.

Kay Johns: I found that the Core of the Engine (computer) related more to my subconscious mind. It felt like I was experiencing a dream filled full of random questions and different locations around Brighton, which were reminiscent of some of my own thoughts and memories. I'm curious was the core of the engine both the subconscious merged with the conscious mind?

Shardcore: *The part of our mind that we live in, our wakeful consciousness, is but a small part of the machinations of our brains. Indeed, experiments show that the conscious mind is often 'the last to know' about what we, as individual functional entities, are doing.*

So, rather than considering the subconscious in a Freudian way, I tend to see the conscious mind as a machine struggling to make sense of a series of events coming from both 'external sources' (what we see, hear, taste etc) and 'internal sources' (our memories, expectations and desires) - I guess you could consider the latter as 'the subconscious', but I tend to see them as an integrated system, with consciousness as the final layer.

It was important that the video sources used were of locations and events that may be familiar, this allows the piece to feel more like a mind like occupying a coherent space, and also to use these experiences to provoke memories and sensations in the viewer who may occupy a set of spaces and experiences.

The subconscious is generally seen as inaccessible, only visible via oblique projections, such as dream analysis. For this piece we wanted it to consider the direct conscious experience of the now.

The Consciousness Engine by Shardcore and Sam Hewitt:

http://fortunecatproductions.com/?category_name=the-consciousness-engine

Bibliography

Books

Lorenz, E. (2005) *The Essence of Chaos*. Taylor & Francis e-library. p. vii (preface)

Pearson, M. (2010) *Generative Art*, MEAP Edition, Manning Publications.

Films

Tron Legacy (2010) Directed by Joseph Kosinski. U.S.A Walt Disney Pictures (DVD).

Journals

Margaret A. Boden & Ernest A. Edmonds (2009): *What is generative art?*, Digital Creativity 2009, Vol. 20, Nos. 1–2, pp. 21–46.

Television Programs

The Secret Life of Chaos (Documentary) (2010) Stacey, N. TV. BBC Four, 9 Dec. 19.30 hrs. 60mins.

Websites & Internet Sources

Encyclopaedia Britannica, *Chaos (in chaos theory, mathematics and mechanics)*, [Internet] <http://www.britannica.com/EBchecked/topic/86687/butterfly-effect> [Accessed on 12th November 2011].

Encyclopaedia Britannica, *Edward Lorenz*, [Internet], <http://www.britannica.com/EBchecked/topic/348155/Edward-Lorenz> [Accessed on 12th November 2011].

Galanter, P. *Generative Art is as old as Art*. (2004) [Internet]
<http://www.artificial.dk/articles/galanter.htm> [Accessed 4th November 2011].

Galenter, P. *What is Generative Art? Complexity Theory as a Context for Art Theory*.
[internet] http://philipgalanter.com/downloads/ga2003_what_is_genart.pdf
[Accessed on 2nd January 2011].

Galenter, P. (2009) *The Generative Bodies Series*. [Internet]
<http://philipgalanter.com/art/generativebodies/a/> [Accessed on 2nd January 2011].

GA2011,(1998) *XIV Generative Art International Conference*. [Internet]
<http://www.generativeart.com/> [Assessed 2nd November, 2011].

Langlois, D. (1997) *Steina and Woody Vasulkas Fonds* [Internet]
<http://www.fondation-langlois.org/html/e/page.php?NumPage=422> [Assessed on 3rd
15th November 2011].

Marius Walz(2005) <http://www.generatorx.no/generatorx-introduction/> [Assessed on
12th November, 2011].

Nechvatal, J. (2002) *Computer Virus 2.0*. [Internet] <http://www.nechvatal.net/>
[Assessed on 22nd November 2011].

Shardcore,(2011) *The Consciousness Engine* [Internet]
http://fortunecatproductions.com/?page_id=32 [Assessed 6th June 2011].